NPL CANDIDATE

Update #

Received: JUL 15 1987

02NJ186

**Facility Name:** Lakewood Township Sanitary Landfill

**Location:** Lakewood Township, Ocean County, New Jersey

**EPA Region:** II

**Person(s) in Charge of the Facility:** Dr. Jorge Berkowitz
NJDEP - HSMA

**Name of Reviewer:** Robert Hayton **Date:** 9/12/85

**General Description of the Facility:**

**(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)**

Lakewood Township Sanitary Landfill is located in Lakewood Township, Ocean County, New Jersey. The landfill was closed in 1984 by N.J. DEP. In 1976 and 1977, the landfill accepted 4,240,000 gallons of liquid chemical wastes. The site is underlain by the Cohansey/Kirkwood aquifer which is used as a major water supply for the surrounding communities.

**Scores:** $S_M$ = 50.78 ($S_{gw}$ = 87.61 $S_{sw}$ = 6.54 $S_a$ = N/A )

$S_{FE}$ = N/A

$S_{DC}$ = N/A

**HRS COVER SHEET** Prepared by Robert Hayton

235869

## GROUND WATER ROUTE WORK SHEET

| | Rating Factor | Assigned Value (Circle One) | Multiplier | Score | Max. Score | Ref. (Section) |
|---|---|---|---|---|---|---|
| 1 | Observed Release | (0) 45 | 1 | 0 | 45 | 3.1 |
| | If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2. | | | | | |
| 2 | Route Characteristics | | | | | 3.2 |
| | Depth to Aquifer of Concern | 0 1 2 (3) | 2 | 6 | 6 | |
| | Net Precipitation | 0 1 (2) 3 | 1 | 2 | 3 | |
| | Permeability of the Unsaturated Zone | 0 1 2 (3) | 1 | 3 | 3 | |
| | Physical State | 0 1 2 (3) | 1 | 3 | 3 | |
| | Total Route Characteristics Score | | | 14 | 15 | |
| 3 | Containment | 0 1 2 (3) | 1 | 3 | 3 | 3.3 |
| 4 | Waste Characteristics | | | | | 3.4 |
| | Toxicity/Persistence | 0 3 6 9 12 15 (18) | 1 | 18 | 18 | |
| | Hazardous Waste Quantity | 0 1 2 3 4 5 6 7 (8) | 1 | 8 | 8 | |
| | Total Waste Characteristics Score | | | 26 | 26 | |
| 5 | Targets | | | | | 3.5 |
| | Ground Water Use | 0 1 (2) 3 | 3 | 6 | 9 | |
| | Distance to Nearest Well/Population Served | 0 4 6 8 10 12 16 18 20 24 30 32 35 (40) | 1 | 40 | 40 | |
| | Total Targets Score | | | 46 | 49 | |
| 6 | If line 1 is 45, multiply 1 x 4 x 5<br>If line 1 is 0, multiply 2 x 3 x 4 x 5 | | | 50232 | 57.330 | |
| 7 | Divide line 6 by 57.330 and multiply by 100 | $S_{gw}$ = 87.61 | | | | |

45

## SURFACE WATER ROUTE WORK SHEET

| Rating Factor | Assigned Value (Circle One) | Multiplier | Score | Max. Score | Ref. (Section) |
|---|---|---|---|---|---|
| 1 Observed Release | (0) 45 | 1 | 0 | 45 | 4.1 |
| If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2. | | | | | |
| 2 Route Characteristics | | | | | 4.2 |
| Facility Slope and Intervening Terrain | (0) 1 2 3 | 1 | 0 | 3 | |
| 1-yr. 24-hr. Rainfall | 0 1 (2) 3 | 1 | 2 | 3 | |
| Distance to Nearest Surface Water | 0 1 (2) 3 | 2 | 4 | 6 | |
| Physical State | 0 1 2 (3) | 1 | 3 | 3 | |
| Total Route Characteristics Score | | | 9 | 15 | |
| 3 Containment | 0 1 2 (3) | 1 | 3 | 3 | 4.3 |
| 4 Waste Characteristics | | | | | 4.4 |
| Toxicity/Persistence | 0 3 6 9 12 15 (18) | 1 | 18 | 18 | |
| Hazardous Waste Quantity | 0 1 2 3 4 5 6 7 (8) | 1 | 8 | 8 | |
| Total Waste Characteristics Score | | | 26 | 26 | |
| 5 Targets | | | | | 4.5 |
| Surface Water Use | 0 1 (2) 3 | 3 | 6 | 9 | |
| Distance to a Sensitive Environment | (0) 1 2 3 | 2 | 0 | 6 | |
| Population Served/Distance to Water Intake Downstream | (0) 4 6 8 10 12 16 18 20 24 30 32 35 40 | 1 | 0 | 40 | |
| Total Targets Score | | | 6 | 55 | |
| 6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5 | | | 4212 | 64,350 | |
| 7 Divide line 6 by 64,350 and multiply by 100 | $S_{sw}$ = 6.54 | | | | |

## AIR ROUTE WORK SHEET

| Rating Factor | Assigned Value (Circle One) | Multiplier | Score | Max. Score | Ref. (Section) |
|---|---|---|---|---|---|
| [1] Observed Release | 0 45 | 1 | | 45 | 5.1 |
| Date and Location: | | | | | |
| Sampling Protocol: NO AIR DATA AVAILABLE | | | | | |
| If line [1] is 0, the S = 0. Enter on line [5]. If line [1] is 45, then proceed to line [2]. | | | | | |
| [2] Waste Characteristics | | | | | 5.2 |
| Reactivity and Incompatibility | 0 1 2 3 | 1 | | 3 | |
| Toxicity | 0 1 2 3 | 3 | | 9 | |
| Hazardous Waste Quantity | 0 1 2 3 4 5 6 7 8 | 1 | | 8 | |
| | Total Waste Characteristics Score | | | 20 | |
| [3] Targets | | | | | 5.3 |
| Population Within 4-Mile Radius | 0 9 12 15 18 21 24 27 30 | 1 | | 30 | |
| Distance to Sensitive Environment | 0 1 2 3 | 2 | | 6 | |
| Land Use | 0 1 2 3 | 1 | | 3 | |
| | Total Targets Score | | | 39 | |
| [4] Multiply [1] x [2] x [3] | | | | 35,100 | |
| [5] Divide line [4] by 35,100 and multiply by 100 $S_a$ = | | | | | |

| | S | $S^2$ |
|---|---|---|
| Groundwater Route Score ($S_{gw}$) | 87.61 | 7675.51 |
| Surface Water Route Score ($S_{sw}$) | 6.54 | 42.77 |
| Air Route Score ($S_a$) | | 0 |
| $S_{gw}^2 + S_{sw}^2 + S_a^2$ | | 7718.28 |
| $\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$ | | 87.85 |
| $\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73$ | | $S_M = 50.78$ |

**WORKSHEET FOR COMPUTING $S_M$**

## FIRE AND EXPLOSION WORK SHEET

| Rating Factor | Assigned Value (Circle One) | Multiplier | Score | Max. Score | Ref. (Section) |
|---|---|---|---|---|---|
| 1 Containment | 1 3 | 1 | | 3 | 7.1 |
| 2 Waste Characteristics | | | | | 7.2 |
| Direct Evidence | 0 3 | 1 | | 3 | |
| Ignitability | 0 1 2 3 | 1 | | 3 | |
| Reactivity | 0 1 2 3 | 1 | | 3 | |
| Incompatibility | 0 1 2 3 | 1 | | 3 | |
| Hazardous Waste Quantity | 0 1 2 3 4 5 6 7 8 | 1 | | 8 | |
| Total Waste Characteristics Score | | | | 20 | |
| 3 Targets | | | | | 7.3 |
| Distance to Nearest Population | 0 1 2 3 4 5 | 1 | | 5 | |
| Distance to Nearest Building | 0 1 2 3 | 1 | | 3 | |
| Distance to Sensitive Environment | 0 1 2 3 | 1 | | 3 | |
| Land Use | 0 1 2 3 | 1 | | 3 | |
| Population Within 2-Mile Radius | 0 1 2 3 4 5 | 1 | | 5 | |
| Buildings Within 2-Mile Radius | 0 1 2 3 4 5 | 1 | | 5 | |
| Total Targets Score | | | | 24 | |
| 4 Multiply 1 x 2 x 3 | | | | 1,440 | |
| 5 Divide line 5 by 1,440 and multiply by 100 | | $S_{FE}$ = | | | |

## DIRECT CONTACT WORK SHEET

| | Rating Factor | Assigned Value (Circle One) | Multiplier | Score | Max. Score | Ref. (Section) |
|---|---|---|---|---|---|---|
| 1 | Observed Incident | 0 45 | 1 | | 45 | 8.1 |
| | If line 1 is 45, proceed to line 4<br>If line 1 is 0, proceed to line 2 | | | | | |
| 2 | Accessibility | 0 1 2 3 | 1 | | 3 | 8.2 |
| 3 | Containment | 0 15 | 1 | | 15 | 8.3 |
| 4 | Waste Characteristics<br>Toxicity | 0 1 2 3 | 5 | | 15 | 8.4 |
| 5 | Targets | | | | | 8.5 |
| | Population Within a 1-Mile Radius | 0 1 2 3 4 5 | 4 | | 20 | |
| | Distance to a Critical Habitat | 0 1 2 3 | 4 | | 12 | |
| | Total Targets Score | | | | 32 | |
| 6 | If line 1 is 45, multiply 1 x 4 x 5<br>If line 1 is 0, multiply 2 x 3 x 4 x 5 | | | | 21,600 | |
| 7 | Divide line 6 by 21,600 and multiply by 100 $S_{DC}$ = | | | | | |

January 1983

# DOCUMENTATION RECORDS
# FOR
# HAZARD RANKING SYSTEM

**INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for each in review.**

FACILITY NAME: Lakewood Township Sanitary Landfill

LOCATION: Faraday Avenue/Lakewood Township/Ocean County, New Jersey
STREET, MUNICIPALITY, COUNTY, NJ

Site Description (for transcription to worksheet)

Lakewood Township Sanitary Landfill is located in Lakewood Township, Ocean County, New Jersey. The landfill was closed in 1984 by N.J. DEP. In 1976 and 1977, the landfill accepted 4,240,000 gallons of liquid chemical wastes. The site is underlain by the Cohansey/Kirkwood aquifer which is used as a major water supply for the surrounding communities.

## GROUND WATER ROUTE

1 OBSERVED RELEASE (Ref: _____)

**Contaminants detected (5 maximum):**

**Rationale for attributing the contaminants to the facility:**

* * *

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

**Name/description of aquifer(s) of concern:**

Cohansey/Kirkwood Formation; quartz sands mixed with scattered beds of clay and gravel.

(Ref: Feasibility Assessment by Killam Associates (Attachments A, Pgs. 1-4)

**Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:**

Boring #PN-3 indicates water at 6.5 feet.

(Ref: Attachment A, Pages 9-13.)

**Depth from the ground surface to the lowest point of waste disposal/ storage:**

Elevation of landfill is 106 feet. The fill was found to extend 40 feet below the surface. Eight (8) feet of dry sand separate the refuse and the water table.

(Ref: Attachment A, Page 12 & 12a.)

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

44"

(Ref: HRS Users Manual, Figure 5)
Mean annual lake or seasonal evaporation (list months for seasonal):

32"

(Ref: HRS Users Manual, Figure 4)
Net precipitation (subtract the above figures):

12"

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Sand

(Ref: Well Logs, Attachment A, Pages 9-13. )
Permeability associated with soil type:

10-3 cm/sec

(Ref: HRS Manual )

Physical State

Physical state of substances at time of disposal (or at present tin for generated gases):

Liquid

* * *

(Ref: Annual Operations Statement for a Solid Waste Facility, Attachment C )

3 CONTAIMENT

Containment

Method(s) of waste or leachate containment evaluated:

No leachate containment.

(Ref: Killam Associates, Attachment B.)

Method with highest score:

No liner, landfill encourages ponding.

(Ref: HRS Users Manual, Table 3)

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

1) Chlorobenzene
2) Endosulfan
3) Delta BHC
4) Butyl Benzyl Phthalate
5) Benzo (K) Flouranthene

(Ref: Attachment K)

Compound with highest score:

Endosulfan- Toxicity: Persistance= 18

(Ref: HRS Users Manual)

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

4,240,000 gallons chemical waste liquids

Basis of estimating and/or computing waste quantity:

Attachment C. Lakewood reported accepting 4,240,000 gallons of liquid chemical waste in 1976 and 1977.
Attachment K. Soil sample #5 is of the excavated pit at rear of landfill where some of the liquid waste was disposed of.*

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Lakewood MUA and Toms River Water Co. have supply wells in the Cohansey aquifer.

(Ref: Toms River Water Company & Killam Associates, Inc., Attachment G. )

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

Weed Hopper Flight Center & Dealer Company; corners of Faraday and Whitesville Road.

(Ref: Attachment G. )

Distance to above well or building:

1,000 feet southwest of landfill.

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) or concern within a 3-mile radius and populations served by each:

Toms River Water Company services 69,000 people. (Well #31 is within 1.5 miles of site).

(Ref: Attachment G, Compliance Evaluation Inspection/Map. )

Computation of land area irrigated by supply wells(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

N/A

(Ref: )

Total population served by ground water within a 3-mile radius:

69,000 people.

## SURFACE WATER ROUTE

1 OBSERVED RELEASE (Ref: _____)

**Contaminants detected in surface water at the facility or downhill from it (5 maximum):**

N/A

**Rationale for attributing the contaminants to the facility:**

* * *

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

**Average slope of facility in percent:**

13%

(Ref: USGS Quad Map )

**Name/description of nearest downslope surface water:**

Toms River

(Ref: USGS Quad Map )

**Average slope of terrain between facility and above-cited surface water body in percent:**

1.75% 70 foot drop in elevation over 4,000 feet.

(Ref: USGS Quad Map )

**Is the facility located either totally or partially in surface water?**

No

(Ref: USGS Quad Map )

Is the facility completely surrounded by areas of higher elevation?

Yes No

(Ref: _____)

**1-Year 24-Hour Rainfall in Inches**

2.5 inches.

(Ref: HRS Manual)

**Distance to Nearest Downslope Surface Water**

4,000 feet.

(Ref: USGS Quad Map)

**Physical State of Waste**

Liquid.

* * *

3 CONTAINMENT

**Containment**

Method(s) of waste or leachate containment evaluated:

None.

(Ref: Killam Associates, Inc., Attachment A.)

**Method with highest score:**

**Landfill not covered with no diversion system.**

(Ref: HRS Manual.)

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

1) Chlorobenzene
2) Endosulfan
3) Delta BHC
4) Butyl Benzyl Phthalate
5) Benzo (K) Fluoranthene

(Ref: Attachment K )

Compound with highest score:

Endosulfan- Toxicity & Persistance= 18

(Ref: HRS Manual )

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

4,240,000 gallons of chemical waste liquids.

Basis of estimating and/or computing waste quantity:

Attachment C: Lakewood reported accepting 4,240,000 gallons of chemical waste liquids in 1976 and 1977.

Attachment K: Soil sample #5 is of the excavated pit at rear of landfill where some of the liquid waste was disposed of.

* * *

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Toms River is used for recreation (boating and fishing).

(Ref: NJDEP/Division of Fish & Game Fishing Pamphlet, Attachment I. )

Conversation with H. Clayton, Dover Township Recreation Department. (Attachment J).

Is there tidal influence?

No

(Ref: USGS Quad Map. )

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

N/A

(Ref: )

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

N/A

(Ref: )

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

N/A

(Ref: )

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

N/A

(Ref: )

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

N/A

(Ref:_____)

Total population served:

N/A

Name/description of nearest of above water bodies:

(Ref:_____)

Distance to above-cited intakes, measured in stream miles.

N/A

(Ref:_____)

## AIR ROUTE

1 OBSERVED RELEASE

**Contaminants detected:**

**No Air Data available.**

**Date and location of detection of contaminants**

**Methods used to detect the contaminants:**

**Rationale for attributing the contaminants to the site:**

* * *

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

**Most reactive compound:**

(Ref:_____)

**Most compatible pair of compounds:**

(Ref:_____)

Toxicity

Most toxic compound:

(Ref:_____)

Hazardous Waste Quantity

Total quantity of hazardous waste:

Basis of estimating and/or computing waste quantity:

* * *

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi 0 to 1 mi 0 to 1/2 mi 0 to 1/4 mi

(Ref:_____)

Distance to a Sensitive Environment

(Ref:_____)

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

(Ref:_____)

Distance to critical habitat of an endangered species, if 1 mile or less:

(Ref: _____)

Land Use

Distance to commercial/industrial area, if 1 mile or less:

(Ref: _____)

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

(Ref: _____)

Distance to residential area, if 2 miles or less:

(Ref: _____)

Distance to agricultural land in production within past 5 years, if 1 mile or less:

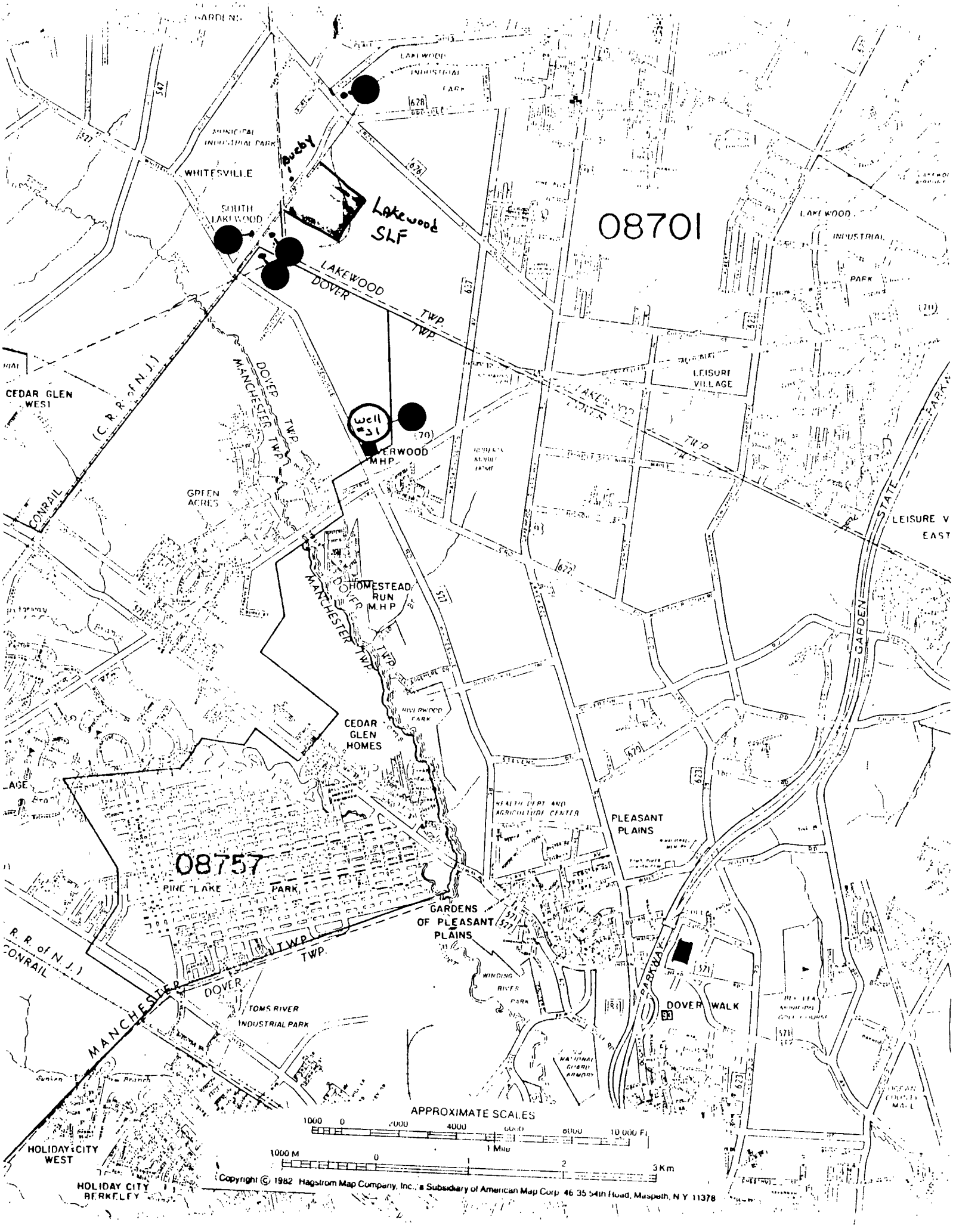
(Ref: _____)

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

(Ref: _____)

Is a historic or landmark site (National Register of Historic Place and National Natural Landmarks) within the view of the site?

(Ref: _____)


08701
Lakewood SLF
Well #31
LAKEWOOD
DOVER
TWP.
WHITESVILLE
SOUTH LAKEWOOD
MUNICIPAL INDUSTRIAL PARK
LAKEWOOD INDUSTRIAL PARK
LEISURE VILLAGE
CEDAR GLEN WEST
(C.R.R. of N.J.)
CONRAIL
DOVER MANCHESTER TWP.
GREEN ACRES
HOMESTEAD RUN M.H.P.
CEDAR GLEN HOMES
PLEASANT PLAINS
GARDEN STATE PARKWAY
08757
PINE LAKE PARK
GARDENS OF PLEASANT PLAINS
WINDING RIVERS PARK
TOMS RIVER INDUSTRIAL PARK
DOVER WALK
HOLIDAY CITY WEST
HOLIDAY CITY BERKELEY
APPROXIMATE SCALES
1000 0 2000 4000 6000 8000 10 000 Ft
1 Mile
1000 M 0 1 2 3 Km
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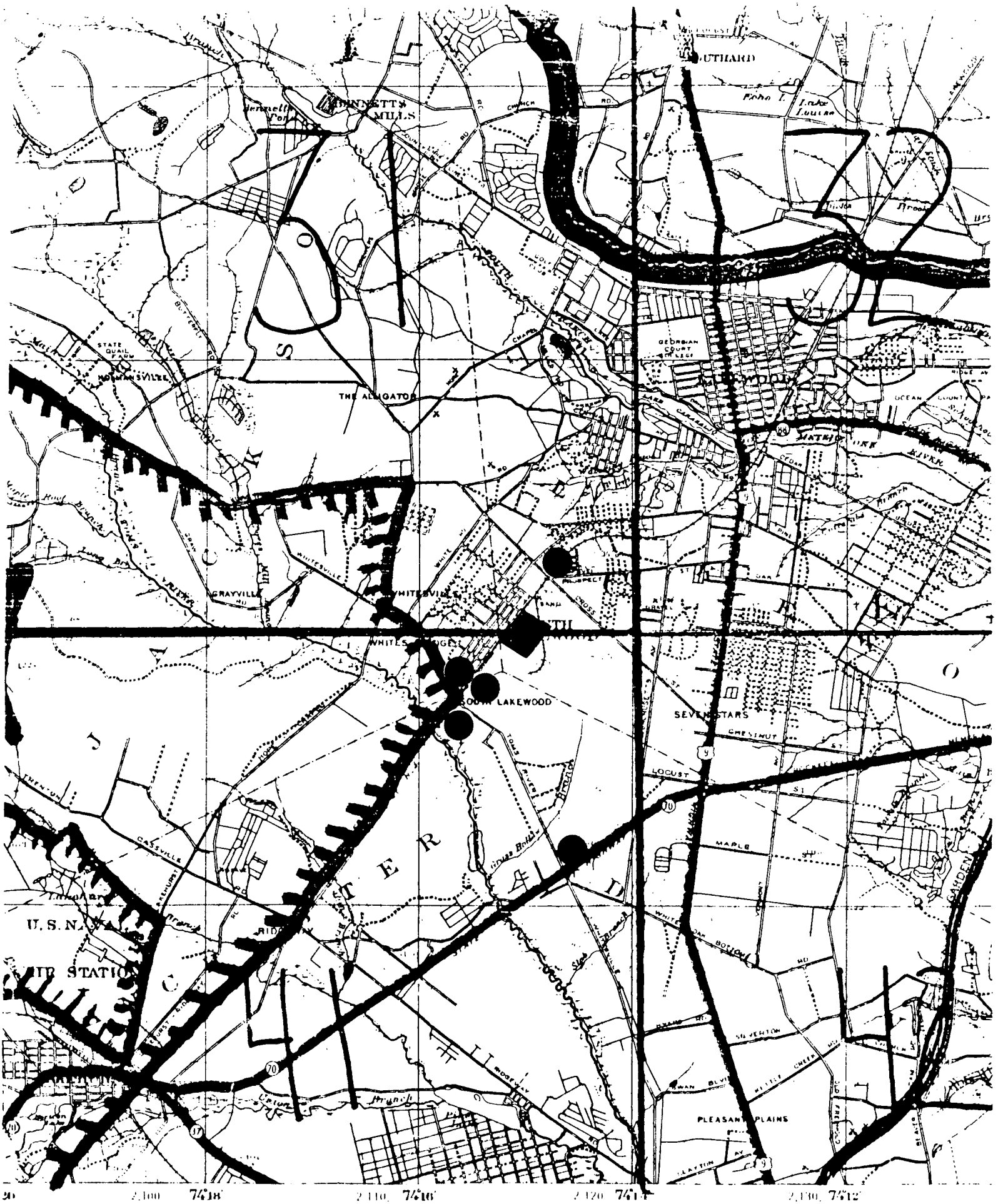
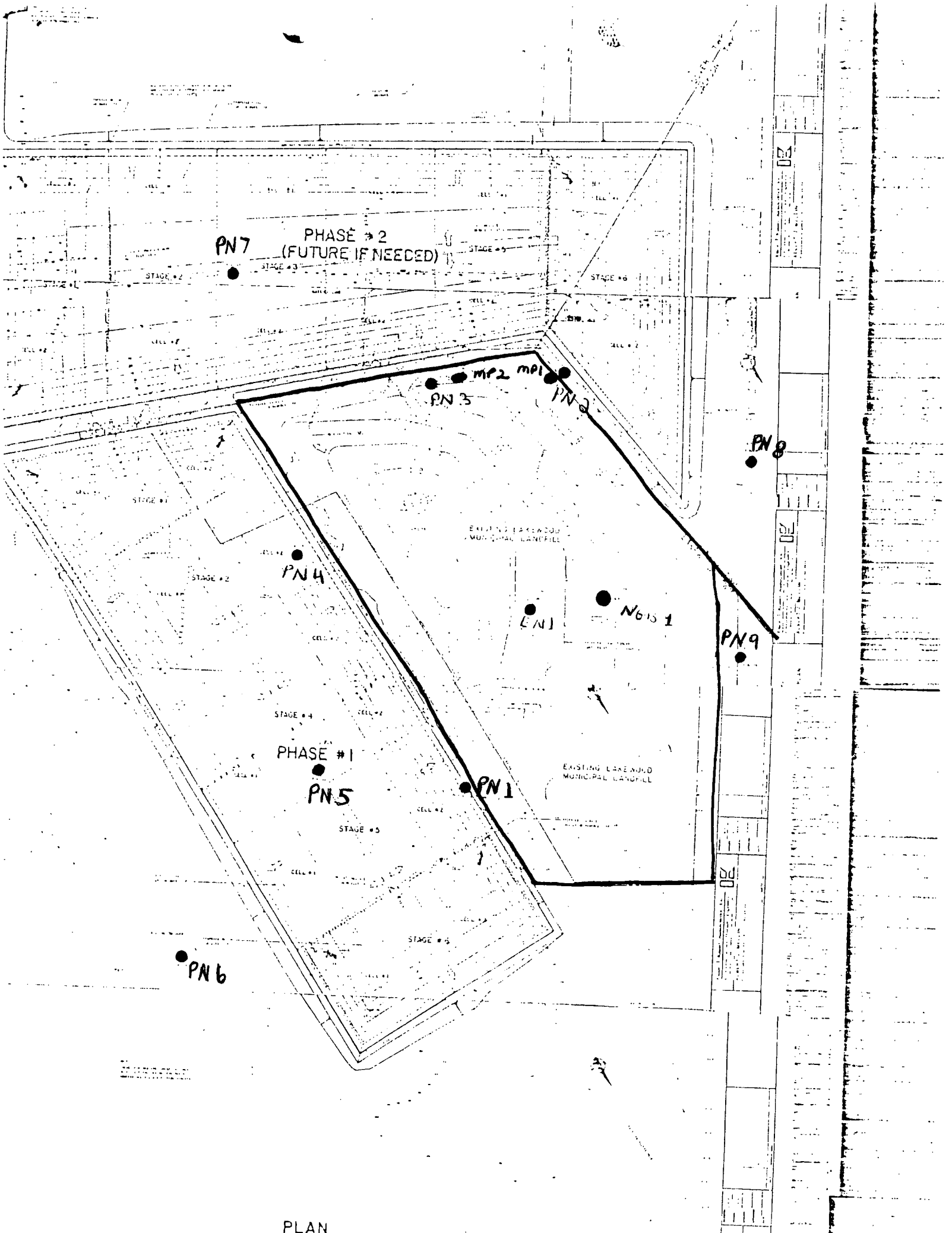



NOTE. The curved lines are level lines drawn on the earth's surface. All points through which any given line passes are at the same level and their height above mean sea level is [illegible]

KEY TO ADJOINING SHEETS


PN7
PHASE #2
(FUTURE IF NEEDED)
STAGE #2
STAGE #3
STAGE #6
MP2
MP1
PN3
PN2
PN8
PN4
STAGE #2
EXISTING LAKEWOOD
MUNICIPAL LANDFILL
EN1
N615 1
PN9
STAGE #4
PHASE #1
PN5
PN1
EXISTING LAKEWOOD
MUNICIPAL LANDFILL
STAGE #5
STAGE #3
PN6

PLAN